

1. Find the molar mass of
- Fe_2O_3

$$\text{mass of } \text{Fe}_2\text{O}_3 = (\text{mass of Fe} \times 2) + (\text{mass of Oxygen} \times 3)$$

$$\boxed{159.6 \text{ g}} = (55.8 \times 2) + (16.0 \times 3)$$

2. Find the percent composition of iron in
- Fe_2O_3

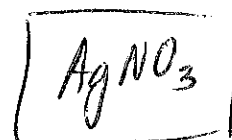
$$\frac{\text{mass of Fe (all Fe)}}{\text{mass of compound}} = \frac{111.6}{159.6} \times 100 = 69.9\%$$

3. The percent composition of a compound was found to be 63.5 % silver, 8.2 % nitrogen, and 28.3 % oxygen. Determine the compound's empirical formula.

$$63.5 \text{ g Ag} \left(\frac{1 \text{ mol Ag}}{107.9 \text{ g}} \right) = \frac{0.5885 \text{ mol Ag}}{0.5857} = 1 \text{ mol Ag}$$

$$8.2 \text{ g N} \left(\frac{1 \text{ mol N}}{14 \text{ g}} \right) = \frac{0.5857 \text{ mol N}}{0.5857} = 1 \text{ mol N}$$

$$28.3 \text{ g O} \left(\frac{1 \text{ mol O}}{16 \text{ g}} \right) = \frac{1.769 \text{ mol O}}{0.5857} = 3 \text{ mol O}$$



4. Determine the molecular formula of a compound with an empirical formula of
- NH_2
- and a formula mass of 32.06 amu.

$$\text{NH}_2 = (\underset{\text{N}}{14.0 \text{ g}}) + (\underset{\text{H}}{2 \times 1.0 \text{ g}}) = 16.0 \text{ g NH}_2 \text{ (empirical formula mass)}$$

$$\text{N}_{(1 \times 2)} \text{H}_{(2 \times 2)} = \boxed{\text{N}_2\text{H}_4}$$

$$\frac{\text{Molecular formula mass}}{\text{Empirical formula mass}} = \frac{32.06}{16.0 \text{ g}} = 2$$

5. A compound containing 5.9265 % H and 94.0735 % O has a molar mass of 34.01468 g/mol. Determine the empirical and molecular formula of this compound.

do not complete